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Indian Standard

SPECIFICATION FOR MANGANESE ACETATE

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard
SPECIFICATION FOR MANGANESE ACETATE

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Indian Standard
SPECIFICATION FOR MANGANESE ACETATE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standard Institution on 28 March 1985, after the draft finalized by the Inorganic Chemicals (Misc) Sectional Committee had been approved by the Chemical Division Council.

0.2 Manganese acetate finds extensive use in textile dyeing as catalyst in various chemical processes involving oxidation, and in paint and varnish industry. Manganese acetate is also used as fertilizer, food packaging and food additives. However, this standard does not cover manganese acetate when used as fertilizer, in food packaging and as food additive.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 - 1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for manganese acetate.

2. REQUIREMENTS

2.1 Description — The material shall be deep pale pink coloured crystalline powder. It shall be free from foreign matter.

2.2 The material shall comply with the requirements given in Table 1 when tested according to the methods prescribed in Appendix A. Reference to the relevant clauses of Appendix A is given in col 4 of Table 1.

*Rules for rounding off numerical values (*revised*).

TABLE 1 REQUIREMENTS FOR MANGANESE ACETATE

(*Clause* 2.2)

Sl No.	Characteristic	Requirement	Method of Test (Ref to Cl No. in Appendix A)
(1)	(2)	(3)	(4)
i)	Assay (as Mn), percent by mass, *Min*	25·0	A-1
ii)	Chlorides (as Cl), percent by mass, *Max*	0·01	A-2
iii)	Iron (as Fe), percent by mass, *Max*	0·008	A-3
iv)	Sulphates (as SO_4), percent by mass, *Max*	0·3	A-4

3. PACKING AND MARKING

3.1 Packing — Unless otherwise agreed to between the purchaser and the supplier, the material shall be packed in polyethylene lined corrugated boxes contained in strong wooden boxes.

3.2 Marking — Each container shall be legibly and indelibly marked with the following information :

a) Name of the material;

b) Gross and net mass;

c) Year of manufacture;

d) Name of the manufacturer and/or his trade-mark, if any; and

e) Batch number.

3.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 Representative samples of the material shall be drawn and adjudged as prescribed in Appendix B.

APPENDIX A

(*Clause* 2.2)

METHODS OF TEST FOR MANGANESE ACETATE

A-0. QUALITY OF REAGENTS

A-0.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070 - 1977*) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-1. ASSAY

A-1.1 Reagents

A-1.1.1 *Concentrated Nitric Acid* — *see* IS:264 - 1976†

A-1.1.2 *Sodium Bismuthate* — powder.

A-1.1.3 *Ferrous Ammonium Sulphate Solution* — 0·1 N (approximately)

A-1.1.4 *Standard Potassium Parmanganate Solution* — 0·1 N.

A-1.2 Procedure — Weigh accurately about 1 g of the sample into a 250-ml volumetric flask, dissolve in water and make up the volume to the mark. Transfer 25 ml of it into a 500-ml iodine flask containing an ice cooled mixture of 75 ml of water and 20 ml of nitric acid add 1·5 g of sodium bismuthate and shake gently for 2-3 minutes. Dilute with 100 ml of water, washing down the sides and filter through a sintered glass funnel. Wash the flask and funnel with minimum quantity of ice cold nitric acid diluted with 33 volumes of water until the washing is colourless. To the filtrate and washing collected in a 500-ml conical flask, add 50 ml of standard ferrous ammonium sulphate and titrate the excess of it with standard potassium permanganate. Find out the blank reading by titrating with 50 ml of ferrous ammonium sulphate mixed with a ice cooled mixture of 100 ml of water and 20 ml of nitric acid with standard potassium permanganate solution.

A-1.3 Calculation

$$\text{Assay (as Mn), percent by mass} = \frac{(V_1 - V_2) \times N \times 11}{M}$$

*Specification for water for general laboratory use (*second revision*).

†Specification for nitric acid (*second revision*).

where

V_1 = volume in ml of standard potassium permanganate solution required for the blank,

V_2 = volume in ml of standard potassium permanganate solution required for the sample,

N = normality of standard potassium permanganate solution, and

M = mass in g of the material taken for the test.

A-2. CHLORIDE

A-2.1 Reagents

A-2.1.1 *Dilute Nitric Acid* — 10 percent (*v/v*).

A-2.1.2 *Silver Nitrate Solution* — 10 percent (*m/v*).

A-2.1.3 *Standard Chloride Solution* — Dissolve 0·1649 g of ignited sodium chloride in 1 000 ml of water. One millilitre of the diluted solution is equivalent to 0·01 mg of chloride (as Cl).

A-2.2 Apparatus

A-2.2.1 *Nessler Cylinder* — 50-ml capacity (*see* IS : 4161 - 1967*).

A-2.3 Procedure — Dissolve 1 g of sample in water and make up to 100 ml in a volumetric flask. Pipette 10 ml of the made up solution (preserve the rest of solution for iron and sulphate tests) into a Nessler cylinder. Acidify with 10 ml of dilute nitric acid (1 : 9) followed by 1 ml of 10 percent silver nitrate solution, make up to 50 ml and stir well. Any turbidity produced should not be more than that of 0·01 mg of chloride when treated in a similar manner as aliquot.

A-3. IRON

A-3.1 Reagents

A-3.1.1 *Concentrated Hydrochloric Acid — see* IS : 265 - 1976†.

A-3.1.2 *Butanolic Potassium Thiocyanate* — Dissolve 10 g of potassium thiocyanate in 10 ml of water. Add sufficient *n*-butanol to make up to 100 ml and shake vigorously until the solution is clear.

A-3.1.3 *Standard Iron Solution* — Dissolve 0·702 g of ferrous ammonium sulphate [$Fe(NH_4)_2(SO_4).6H_2O$] in 10 ml of dilute

*Specification for Nessler cylinder.

†Specification for hydrochloric acid (*second revision*).

sulphuric acid (10 percent *v/v*) and dilute with water to 1 000 ml. Take 10 ml of this solution and dilute to 1000 ml. One millilitre of this solution contains 0·001 mg of iron (as Fe).

A-3.2 Procedure — Pipette 10 ml of solution from **A-2.1** into a test tube, add 1 ml of concentrated hydrochloric acid followed by 3 drops of standard potassium permanganate solution and mix well. Add 10 ml of butanolic potassium thiocyanate to this, shake vigorously and allow the layers to separate. Any colour produced in the butanolic layer should not be deeper than that produced by 0·008 mg of iron when treated in a similar manner as aliquot.

A-4. SULPHATE

A-4.1 Reagents

A-4.1.1 *Dilute Hydrochloric Acid* — 10 percent (*v/v*).

A-4.1.2 *Barium Chloride Solution* — 10 percent (*m/v*).

A-4.1.3 *Standard Sulphate Solution* — Dissolve 1·48 g of ignited sodium sulphate (Na_2SO_4) in water and dilute to 1 000 ml. Take 10 ml of this solution and dilute to 100 ml. One millilitre of this solution contains 0·1 mg of sulphate (as SO_4).

A-4.2 Procedure — Pipette 10 ml of solution from **A-2.1** into a Nessler cylinder. Acidify with 1 ml of 10 percent hydrochloric acid followed by 2 ml of barium chloride solution, make up to the mark and stir well. Any turbidity produced should be not more than that of 0·3 mg of sulphate when treated in a similar manner as aliquot.

APPENDIX B

(*Clause* 4.1)

SAMPLING OF MANGANESE ACETATE

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall not be taken at the place exposed to adverse affects of weather.

B-1.2 The sampling instruments and sample containers shall be clean and dry.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 To draw a representative sample, the contents of each container selected for sampling shall be mixed as thoroughly as possible by suitable means.

B-1.5 The samples shall be placed in clean, dry and airtight glass or other suitable containers on which the material has no action.

B-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

B-1.7 Each sample container shall be sealed airtight after filling and marked with full details of sampling the date of sampling and the lot and batch numbers.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the containers in a single consignment of the material drawn from the same batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture the containers belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

B-2.2 Samples shall be tested for each lot for ascertaining the conformity of the material to the requirements of this specification.

B-2.3 The number of containers (n) to be chosen from a lot shall depend upon the size of the lot (N) and shall be in accordance with Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

Lot Size	Sample Size
Up to 50	3
51 ,, 100	4
101 ,, 150	5
151 ,, 300	7
301 and above	10

B-2.4 These containers shall be chosen at random from the lot. In order to ensure the randomness of selection, reference may be made to IS : 4905-1968*.

*Methods for random sampling.

B-3. NUMBER OF TESTS

B-3.1 Test for the determination of assay shall be conducted on individual sample.

B-3.2 Test for the determination of all other characteristics given in Table 1 shall be conducted on composite sample.

B-4. CRITERIA FOR CONFORMITY

B-4.1 For Individual Sample — From the test results, the average and the range shall be calculated as follows:

$$\text{Average} = \frac{\text{Sum of the test results}}{\text{Number of tests}}$$

Range = The difference between the maximum and the minimum values of the test results.

The lot shall be declared as conforming to the requirements of assay if $\bar{X} - 0{\cdot}6\,R$ is greater than the minimum value specified.

B-4.2 Composite Sample — For declaring the conformity of the lot to the requirements of all other characteristics tested on the composite sample, the test result for each characteristic shall satisfy the relevant requirements given in Table 1.

(*Continued from page* 2)

Members	*Representing*
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